REMARKS

The present application is a U.S. national application of PCT Application No. PCT/IL99/00639 filed November 26, 1999. The claims in the present application were amended by limiting the number of claims and removing multiple dependencies, to reduce costs and put them in better form for examination in the US.

Applicants wish to bring to the attention of the Examiner that the claims in the present application are based on those attached to the International Preliminary Examination Report dated February 26, 2001 issued by the European Patent Office (acting as IPEA).

Attached is a marked up set of the amended claims.

An examination on the merits is respectfully requested.

Respectfully submitted,
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Version with Markings to Show Changes Made

6.(Amended) A method according to claim 1 ~~any of claims 1-5~~, comprising calculating said boundary visualization value during said ray casting.

8. (Amended) A method according to claim 1 ~~any of claims 1-6~~, comprising:

providing an index array indicating for at least some of said voxels if a class-boundary does not pass near the voxel.

12. (Amended) A method according to claim 1~~any of claims 1-11~~, wherein said associated boundary visualization value comprises a surface lighting calculation of said boundary.

13. (Amended) A method according to claim 1 ~~any of claims 1-12~~, comprising stopping said ray casting if said accumulated opacity is over a threshold.

14. (Amended) A method according to claim 1~~any of claims 1-13~~, wherein said sampling points are separated by a step size and wherein said step size is dependent on the opacity value at the sampling points.

18. (Amended) A method according to claim 1~~any of claims 1-17~~, comprising providing a definition of voxel value intervals for each class, prior to said ray casting.

19. (Amended) A method according to claim 1~~any of claims 1-18~~, comprising:

interpolating between voxels near said point; and

transforming said interpolated voxel value into an opacity value for said point.

22. (Amended) A method according to claim 1~~any of claims 1-21~~, wherein said predetermining location is within the voxel space.

23. (Amended) A method according to claim 1 ~~any of claims 1-22~~, wherein said voxel data set comprises a medical imaging data set.

24. (Amended) A method according to claim 1~~any of claims 1-23~~, wherein (g) comprises:

sparely casting rays; and

determining if to cast at least one additional ray between cast rays.

27. (Amended) A method according to claim 25~~ or claim 26~~, wherein statistical homogeneity is determined with respect to depth factors associated with the ray.

28. (Amended) A method according to claim 1~~any of claims 1-27~~, wherein (h) comprises interpolating between stored values of cast rays.

29. (Amended) A method according to claim 1~~any of claims 1-27~~, wherein (g) comprises progressively increasing the density of raycasting.

32. (Amended) A method according to claim 1~~any of claims 1-31~~, comprising rendering said formed perspective rendering on a display.

33. (Amended) A method according to claim 1~~any of claims 1-32~~, comprising defining a window in or near the voxel space through which to cast said rays.

35. (Amended) A method according to claim 33~~ or claim 34~~, wherein said window is flat and rectangular.

36. (Amended) A method according to claim 33~~ or claim 34~~, wherein said window is curved.

37. (Amended) A method according to claim 33~~claim 33-36~~, wherein said window is defined by pixels in a uniformly spaced rectangular grid.

38. (Amended) A method according to claim 33~~claim 33-36~~, wherein said window is defined by pixels using coordinates which are one of circular coordinates, elliptical coordinates and another conic projection of coordinates.

39. (Amended) A method according to claim 1~~any of claims 1-38~~, wherein said accumulation of opacity comprises updating a storage value CT as follows: CT=CT*T^step_size, where T is a transparency value corresponding to the opacity value.

40. (Amended) A method according to claim 1~~any of claims 1-39~~, wherein said rays are cast in parallel.

41. (Amended) A method according to claim 1~~any of claims 1-40~~, wherein the voxel data set is generated by one of CT (Computerized Tomography), MRI (Magnetic Resonance Imaging), Ultrasound, a geophysical survey, a meteorological survey, a scientific simulation, an animation model having more than two dimensions and a set of simultaneous equations.

42. (Amended) A method according to claim 1~~any of claims 1-41~~, wherein each voxel has associated therewith a visual representation value and comprising:

determining a visualization value associated with a sampled point from the voxel associated visual representation values; and

accumulating said point associated visualization value into said stored value.

45. (Amended) A method according to claim 42~~any of claims 42-44~~, wherein accumulating said point associated visualization values comprises selectively accumulating values based on front surface detection.

46. (Amended) A method according to claim 42~~any of claims 42-45~~, wherein said point associated visualization value comprises a volume lighting value.

47. (Amended) A method according to claim 42~~any of claims 42-46~~, wherein said point associated visualization value comprises a surface lighting value.

48. (Amended) A method according to claim 1~~any of claims 1-47~~, wherein advancing along a ray is coordinated with an opacification process.

49. (Amended) Apparatus for forming a perspective rendering from a voxel space including:

(a) a memory for storing a voxel data set;

(b) a computer processor for applying the method of claim 1 ~~any of the claims 1-48~~ to said stored data set to form said perspective rendering; and

(c) a second memory for storing said formed perspective rendering.